Lab evaluation

* Many students missed one or more elements of the lab – didn’t read rubric or didn’t read page – tell students to read lab fully
* Students had difficulty with positive/negative enthalpies and mixed it up
  + If they missed the negative sign or a negative change in temp, some would get the wrong ign to their enthalpy.
* My mistake: but a thermochemical eq would have a molar value for enthalpy – not per gram – no marks were deducted for those who wrote an eq and used the per gram value
* Me asking for a title/title page made many of them feel they needed to come up with a clever title – it was nice to see them but didn’t affect marks
* Most students tried to find the ‘closest value’ in the table but you need to think of the most likely comparative value. Is it likely that your water absorbed more heat than a reaction done in perfect conditions? If you believe so, then you can choose a table value that is lower than yours. That being said, I don’t think so. And logic would dictate otherwise – that it is likely that you lost heat that has gone unaccounted for, rather than gained magical heat from somewhere. Now, consider sources of error, and ‘how much’ error you had. Perhaps you had a substance with an enthalpy of +0.300kJ/g and there was another with +0.270kJ/g but your results led you to an experimental value of +0.250kJ/g. At this point the choice is yours, as long as you justify it. Based on how well you did the lab and uncontrollable factors, it really could be either, although it is less likely to be a compound with an enthalpy of +0.230kJ/g.
* Students MUST proofread their work for grammar, spelling, and syntax. I didn’t deduct many marks, but a poorly written paragraph may have been the result of a loss of -1 or -0.5. Part of being a scientist is being able to convey your ideas properly. Also, some students used slang terminology. “ the error may have ‘messed up’ our calculations.” This doesn’t belong in a formal paper.

Experimental design.

The goal of this lab was to determine the enthalpy of solution of a compound so that we might identify it. A measured mass of mystery substance was placed into a measured mass of water in a calorimeter. The solution reaction took place inside this insulated environment as to trap all of the heat released/absorbed by the reaction. A thermometer was used to measure the change in temperature of the water for this reaction. The reaction was stirred continuously as to ensure even distribution of heat. The temperature change was used along with the mass of water and mass of substance in calorimetric calculations (∆H =mc∆T/M) to determine the enthalpy of the substance. This value was then compared to known chart values to determine the identity of the substance.

If I am dissolving something in water, the thermochemical equation is:a

NaBr(s) 🡪 Na+(aq) + Br-(aq) ∆H = ……

Some ppl created neutralization equations or whatnot